



Five-Year Review Report

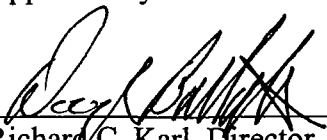
Second Five-Year Review Report for Columbus Old Municipal Landfill #1 Columbus, Bartholomew County, Indiana

September 2005

Prepared by:
**United States Environmental Protection Agency
Region 5
Chicago, Illinois**

Approved by:

Date:

for 

Richard C. Karl, Director
Superfund Division
U.S. EPA, Region 5

9/23/05

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List of Acronyms

AOC	Administrative Order on Consent
ARARs	applicable or relevant and appropriate requirements
bls	below land surface
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
FS	feasibility study
FWQC	federal water quality criteria
GRSC	groundwater recovery system contingency
IDEM	Indiana Department of Environmental Management
IRA	interim remedial action
LC ₅₀	lethal concentration that kills 50% of test subjects in a given time
MCL	maximum contaminant level
MDL	method detection limit
msl	mean sea level
MW	monitoring well
NCP	National Contingency Plan
NPL	National Priorities List
OCL	Columbus Old City Municipal Landfill #1
PCBs	polychlorinated biphenyls
PRPs	potentially responsible parties
RA	remedial action
RD	remedial design
RI	remedial investigation
ROD	Record of Decision
SMCL	secondary maximum contaminant level
SOW	statement of work
SPM	state project manager
SVOC	semi-volatile organic compound
TOC	total organic carbon
TPH	total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

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Executive Summary

The remedy for the Columbus Old Municipal Landfill #1 (OCL) site in Columbus, Bartholomew County, Indiana, included: fence installation with appropriate warning signs, landfill cover inspection and maintenance program, groundwater recovery system contingency plan, additional groundwater monitoring wells, groundwater monitoring program, and institutional controls restricting the use of the land and water at the site. The site achieved construction completion with the signing of the Preliminary Close Out Report on September 15, 1994. The trigger for this review was the signing of the first five-year review report on September 22, 2000.

The assessment of this five-year review is that the recommendations made in the first five-year review report were implemented. The selected remedy is functioning as anticipated. The remedy is protective of human health and the environment in the short term. It is not protective in the long term because some of the institutional controls have not been implemented. Long-term protectiveness will be achieved once the required institutional controls have been implemented.

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Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name (from <i>WasteLAN</i>): Columbus Old Municipal Landfill #1		
EPA ID (from <i>WasteLAN</i>): IND980607626		
Region: 5	State: IN	City/County: Columbus/Bartholomew County
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify) _____		
Remediation status (choose all that apply): <input type="checkbox"/> Under construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
Multiple OUs?* <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Construction completion date: 9/15/94
Has site been put into reuse? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
REVIEW STATUS		
Lead Agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: Bernard J. Schorle		
Author title: Remedial Project Manager		Author affiliation: USEPA, Region 5
Review period:** 10/03 to 9/05		
Date(s) of site inspection: 10/10/03 and 8/31/05		
Type of review: <input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> Non-NPL remedial action site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional discretion <input type="checkbox"/> NPL-removal only		
Review number: <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <input type="checkbox"/> Actual RA on-site construction at OU # _____ <input type="checkbox"/> Actual RA start at OU # _____ <input type="checkbox"/> Construction completion <input checked="" type="checkbox"/> Previous five-year review report <input type="checkbox"/> Other (specify) _____		
Triggering action date (from <i>WasteLAN</i>): 9/22/00		Due date: 9/22/05

*--"OU" refers to operable unit

**--Review period should correspond to the actual start and end dates of the five-year review in *WasteLAN*

Issues: The main issue that has been identified for the site is the fact that not all of the institutional controls have been implemented. Currently there is a "declaration of restrictions and covenants upon real estate" in place for only a portion of the Site.

Recommendations and Follow-up Actions: The institutional controls that are missing must be implemented. It should be possible to complete this within about six months.

The follow-up actions to be implemented at the site include remedial action completion by the responsible parties and certification by IDEM staff. Maintenance and monitoring of the site will continue, as needed, and will consist of activities to be determined. Five-year reviews will continue.

Protectiveness Statement(s): The remedy is protective of human health and the environment in the short-term. The remedy is not protective of human health and the environment in the long term since some of the institutional controls that are needed to prevent future exposure to, or ingestion of, contaminated groundwater and exposure to the contents of the waste disposal area have not been implemented. Long-term protectiveness will be achieved once the required ICs have been implemented. Threats at the site are being addressed through groundwater monitoring and continued maintenance of the site.

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**Columbus Old Municipal Landfill #1 Superfund Site
Columbus, Bartholomew County, Indiana
Second Five-Year Review Report**

I. Introduction

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of the review are documented in a five-year review report. In addition, the five-year review report identifies issues found during the review, if any, and provides recommendations to address them.

The U.S. Environmental Protection Agency (USEPA) is preparing this five-year review report pursuant to §121 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Part 300). The report is a modification of the report that was prepared by the staff of the Indiana Department of Environmental Management (IDEM) during the latter part of 2004. It was necessary to make changes in the report to update it and address the institutional controls more fully. Although much of the IDEM report has been included here, USEPA is responsible for the content of the report.

CERCLA §121 states:

If the president selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The president shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

IDEM and Region 5 of USEPA have conducted this five-year review of the remedy implemented at the Columbus Old Municipal Landfill #1 (sometimes called the "Old City Landfill" (OCL)) Superfund site in Columbus (Bartholomew County), Indiana, a National Priorities List (NPL) site. This review was conducted for the entire site by the remedial project manager and the state project manager for the period from September 2000 through August 2005. This report documents the results of the review.

This is the second five-year review for the OCL site. The triggering action for this statutory review is the signing of the first five year review report on September 22, 2000. The five year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use or unrestricted exposure.

II. Site Chronology

Event	Date
Landfill Operations	1938-1966
Proposed for placement on the National Priorities List (NPL)	9/18/85
Made final on NPL	6/10/86
Administrative Order on Consent for remedial investigation (RI) and feasibility study (FS)	9/15/87
RI and FS started	9/15/87
RI report approved	8/6/90
FS report approved	12/1/91
Proposed Plan issued	1/23/92
Public meeting held	1/30/92
Record of Decision (ROD) signed	3/31/92
Indiana Department of Environmental Management (IDEM) became lead agency	5/26/92
Consent Decree for remedial design and remedial action	entered 4/16/93
Remedial design (RD) starts	April 1993
Restrictions placed on deed for part of the facility property (9.7 acres)	6/2/93
Remedial action (RA) starts	10/22/93
Preliminary Close Out Report (construction completion under CERCLA)	9/15/94
Fence installation completed	5/7/99
New bridge and approach road over the landfill completed	May 1999
First five-year review report	9/22/00
Interim remedial action (IRA) report from Defendants	4/8/02
Site inspection by IDEM for second five-year review	10/10/03
Site inspection by USEPA and IDEM for second five-year review	8/31/05

III. Background

Physical Characteristics

The Columbus Old Municipal Landfill #1 site is located in the City of Columbus, Indiana, at the intersection of the East Fork of the White River and State Road 11. The portion of the site containing waste material parallels the river, which flows towards the southeast, and covers approximately 19 acres. The top of the landfill was covered with a layer of sand, clay, and gravel after the landfill was closed and grass has grown as vegetative cover. The cover material is generally 2 to 3 feet in thickness across the site, reaching 4 to 5 feet in some places. The depth of the landfill material averages approximately 17 feet over the area of the landfill. Thus, the total volume of the fill material within the landfill was estimated to be about 500,000 cubic yards. Land surface elevations range from approximately 625 feet above mean sea level (msl) at the top of the fill area to 600 feet above msl at the river. The maximum depth at which the bottom of the landfill materials were found was at elevation 602 ft. See Figure 1 for a map showing the area of the site.

The uppermost natural deposit of unconsolidated material at the site consists of coarse sand and gravel-sized material. The sand and gravel deposit extends to a depth of approximately 15 ft. below the natural land surface. Underlying the sand and gravel deposit is an intermittent thin sandy clay and gravel zone (glacial till) approximately 2 to 3 ft. thick. The thin till zone is

underlain by a very coarse sand and gravel deposit which is approximately 15 ft thick. This sand and gravel deposit was found to be continuous across the site. At a depth of approximately 30 to 35 ft below land surface (bls) (elevation 580-575 ft.), silts and clays containing organic material become prominent. Lenses and thin beds of very fine to coarse grained sand containing silt are mixed throughout this zone. Underlying the silt and clay zone is a firm deposit of silt and clay mixed with pebbles (glacial till). This deeper till deposit lies at a depth of approximately 40 to 45 ft bls (elevation 570-565 ft.). Based on the soil borings completed in 1968 for the City of Columbus, this till unit is believed to extend to the shale bedrock interface.

The groundwater flow direction is generally to the south-southeast. Depth to ground water in the OCL area is approximately 5 to 15 ft. bls. At the landfill, where the fill operations have raised the elevation of the land surface, the depth to ground water varies from 15 to 25 ft. below the surface of the landfill. The gravel quarry, located near the southeast corner of the OCL, and the East Fork of the White River both function as discharge points for the ground water that passes through the shallow aquifer beneath the site. During the RI, it was concluded that water table elevation fluctuations have generally not altered the groundwater flow direction and horizontal hydraulic gradients, except for the areas near the river and the quarry.

Approximately 33,000 people live within a 3-mile radius of the site. There are private and public water supply wells located within 2 to 3 miles. The OCL site is located in the 100-year flood plain of the river.

Land and Resource Use

The site forms a low barrier between the farmlands that surround it and the East Fork of the White River to the east. Within the property boundary was the municipal landfill (OCL), a shooting range and a quarry. The shooting range, located on the northwest portion of the property, was used during the 1960's. The quarry, located on the southeast portion of the property, was used until late 1998. Adjacent to the west side of the site, the land is still being used for farming. Completed in April 1999, part of the landfill was utilized for the construction of a new road and bridge across the East Fork of the White River.

History of Contamination

The City of Columbus operated OCL as a municipal landfill from 1938 until 1966. The landfill reportedly accepted municipal and industrial wastes, including solvents, acids, bases, paints and heavy metals. The wastes were deposited within the unlined landfill. The OCL site was proposed for inclusion on the National Priorities List (NPL) in September 1985, and included as final in June 1986.

Extent of Contamination

In 1987, an Administrative Order on Consent (AOC) became effective between USEPA, IDEM, and several of the potentially responsible parties (PRPs) requiring that a remedial investigation (RI) and a feasibility study (FS) be conducted for the site. Under the agreement, the PRP Group investigated the site and determined the nature and extent of contamination at the landfill.

During the remedial investigation, surface and subsurface soil and groundwater samples were analyzed to determine the nature and extent of contamination at the site. Other sampling was also done. The surface and subsurface on-site soil analyses indicated the presence of chloroform, methyl ethyl ketone, and acetone and methylene chloride. All other volatile organic compounds (VOCs) were below the method detection limits (MDLs) for the analytical methods used. All

semi-volatile organic compounds (SVOCs) analyzed for were also below MDLs. Cadmium and mercury were the only inorganics detected above background soil levels.

Groundwater samples collected from the twelve on-site monitoring wells and the background well were analyzed for target compounds. The samples did not contain any VOCs above MDLs that probably were not laboratory contaminants. Four SVOCs were detected above MDLs during the two sampling rounds. In the first round of sampling, 2,4-dimethylphenol (23 µg/l), naphthalene (110 µg/l), and 2-methylnaphthalene (6.63 µg/l) were detected above MDLs in one groundwater sample, but there were no SVOCs detected in the sample from this well during the second round. Bis(2-ethylhexyl)phthalate was detected above MDLs in one sample in the second round of groundwater sampling. Seventeen inorganics (of the twenty-three analytes on the list) were detected in at least two groundwater samples, including cadmium and lead.

The landfill material was also sampled during the RI. VOC constituents detected in the waste material samples included: benzene, ethylbenzene, methylene chloride, toluene, acetone, carbon disulfide, methyl ethyl ketone, methyl isobutyl ketone, and xylene. Semi-volatile constituents found in the landfill material included: fluoranthene (4.9 mg/kg), phenanthrene (6.7 mg/kg), pyrene (3.6 mg/kg), naphthalene (8.2 mg/kg), and 2-methylnaphthalene (2.3 mg/kg). Three of the eight samples analyzed for SVOCs had detections above MDLs. Pesticides and polychlorinated biphenyls (PCBs) detected included: 4,4'-DDD (estimated concentration--57 mg/kg), alpha-chlordane (maximum concentration--93 mg/kg), and Aroclor 1254 (estimated concentration--0.84 mg/kg). The inorganic analyses indicated the presence of cadmium (24 mg/kg), nickel (95 mg/kg), mercury (0.36 mg/kg), and lead (estimated at 21,700 mg/kg).

Site Risks

A number of inorganic and organic constituents were detected during the remedial investigation in groundwater, surface water, and soils in the vicinity of the Old City Landfill. The presence of these constituents may be due to migration of leachate from the landfill materials. There are no on-site exposure points to groundwater at the site. Hypothetical future use of the groundwater as a potable source (assuming concentrations present during the RI occur at off-site downgradient wells) would result in exposure within acceptable health-based guidelines. Current (at the time of the RI) and hypothetical future exposure to the surficial soils were estimated to be within acceptable health-based guidelines. Although no residential properties were located on the site at the time of the RI, and no homes were likely to be built on the landfill within the reasonably foreseeable future, the hypothetical future exposure by an adult or child to surface soils was considered and this resulted in acceptable levels of estimated risk based on non-carcinogenic effects and potentially acceptable estimates of excess lifetime cancer risk.

The environmental risks posed by the constituents of concern were judged to be minimal. All constituents detected in surface water were below background concentrations, federal water quality criteria (FWQC), or laboratory-tested chronic LC₅₀ results. Constituents found in sediments did not vary significantly from typical background levels and therefore are not considered to pose a hazard to aquatic life.

Basis for Taking Action

Based on the results of the remedial investigation, USEPA concluded that no further action, except for the installation of two additional monitoring wells and periodic monitoring of groundwater, was needed at the site. However, it was also concluded that some action would be needed if the road that was contemplated to be built across the landfill was built.

IV. Remedial Action

Remedy Selected

On March 31, 1992, USEPA issued a Record of Decision (ROD) for OCL. The ROD stated that the investigation of the site had shown that OCL, in its condition at the time, was within acceptable health-based and environmental quality-based guidelines. Based upon the fact that the conditions at the site did not pose an unacceptable risk, the selected remedy for this site was "'No Action' (modified)". This primary remedy called for a minimum of two additional groundwater monitoring wells and groundwater monitoring for a minimum of five more years. This is not a no-action remedy since it called for an action, the installation of additional monitoring wells; however, a no-action remedy can require monitoring. Even though wastes remained at the site, this primary remedy did not require that institutional controls, in the form of restrictions on land and water use, be sought, which also is not allowed for a no-action remedy.

The ROD also included a contingent remedy if the planned road and bridge were built over the landfill, referred to as Alternative 2A. Although studies suggested that construction of the roadway should not pose any unacceptable risks, it was not possible to fully predict future site conditions with the roadway in place, so this contingent remedy was identified. Possibly more leachate could be produced from compression of soils and waste material, further contaminating the groundwater. Because it was decided to proceed with the road and bridge, the contingent remedy was implemented. This remedy included fence installation with warning signs, landfill cover inspection and maintenance, development of a contingent groundwater recovery system implementation plan, additional groundwater monitoring wells, a groundwater monitoring program, and deed restrictions on land and water use at the site. In addition, in one place in the ROD it was mentioned that USEPA would request the local municipality to enact a zoning ordinance that would forbid future use of the site and restrict drilling of groundwater wells. Apparently, no such request has been made. IDEM and three of the PRPs signed a Consent Decree (CD) in April 1993 to implement the remedial components of Alternative 2A.

Remedy Implementation

Two additional monitoring wells (MW-24 and MW-25) were installed in November 1993 down-gradient of the site.

Attachment I of the CD Scope of Work (SOW) identified groundwater sampling analytes for the monitoring program, which included iron, manganese, lead, arsenic, total petroleum hydrocarbons (TPH), and total organic carbon (TOC). Groundwater monitoring and inspection of the site were continued on a bi-monthly basis for six months after the bridge construction, through October 1999, having started in December 1993. For the monitoring program, thirteen wells were sampled. No action levels were mentioned in the ROD, but the SOW of the CD did establish criteria for implementation of the groundwater recovery system contingency (GRSC) plan. GRSC implementation would be necessary if the groundwater from an individual well exceeded a maximum contaminant level (MCL) for a target compound in two confirmatory samples. It was never necessary to implement the GRSC plan since the concentrations of the target compounds have been below the MCLs. There were some detections of iron and manganese that exceeded the secondary maximum contaminants (SMCLs). Based on the review of the analytical results in 1999, the monitoring and site inspection schedule was changed to semi-annual and continued until April 2003.

A "Declaration of Restrictions and Covenants Upon Real Estate" was signed by the land owners, two individuals and a trust, on June 2, 1993. This restricted groundwater and land use for part of

the site, consisting of approximately 9.7 acres. It appears that this Declaration covers only landfill area south of the new roadway. This was reportedly recorded with the county on June 7, 1993. No recorded restrictions for the remaining area of the site have been found. No evidence has been found that a local ordinance restricting land and groundwater use at the site has been requested or enacted.

The site achieved construction completion with the signing of the Preliminary Close Out Report on September 15, 1994.

Due to delays, the construction activities for the bridge and roadway did not begin until April 1998. The final design for the bridge called for the western abutment of the bridge to be located at the northwest portion of the landfill. A portion of the landfill was excavated while IDEM staff were at the site. As a health and safety precautionary measure, the bridge contractor monitored the ambient air during the soil excavation. The excavated soil was temporarily staged at the site and was covered and tested. Based on the soil analytical data, the excavated soil was suitable as fill material for the approach road that was built across the landfill.

Fence installation was completed in May 1999, prior to opening the road and bridge to the public. Instead of the six-foot fence called for in the SOW of the CD, the four-foot fence requested by the city, with the approval of IDEM, was installed.

An interim remedial action (IRA) report was completed in March 2002. The PRP Group has submitted a final remedial action report. Before this can be accepted, the remaining deed restrictions need to be implemented.

V. Progress Since the Last Five-Year Review

This is the second five-year review for the site. Since the last review, the PRP Group has been conducting the remedial actions at the site in accordance with the CD and SOW. IDEM and the PRP Group are working on determining what the next steps should be with regard to the site, including what future monitoring may be necessary and whether it may be possible to delete the site from the NPL.

VI. Five-Year Review Process

Administrative Components

Initially, IDEM performed the five-year review and prepared a report. USEPA and IDEM agreed that the process and report would be finished by USEPA because of the added emphasis USEPA is presently placing on the issue of institutional controls. IDEM's OCL five-year review team included the state project manager (SPM) and IDEM's Science Services staff. USEPA assisted in that review. The review consisted of a perusal of past documents that provided history of the site and a review of monitoring results and site inspection reports prepared since the completion of the last five-year review report in September 2000.

USEPA has been working with IDEM personnel and the PRP Group's representative to determine what property has been restricted and to complete the review. USEPA has used the report prepared by IDEM, the reports submitted by the PRP Group, and past documents for the completion of the review.

Community Notification and Involvement

When IDEM was performing the review, it notified the community of the initiation of the five-year review with a press release in the local newspaper, *The Republic*, on October 12, 2003. The community was invited to submit comments concerning the site. The press release reminded the public of the remedy selected and location of the site repository. One written comment letter was received from a concerned citizen and an information request was received from a local reporter. IDEM responded to both requests.

USEPA placed an advertisement in *The Republic* on August 1, 2005. This also announced a comment period, which ended August 30, 2005, and briefly described the remedy. No comments were received as a result of this advertisement.

A notice will be sent out informing the public of the completion of the review and the availability of the report once the report is signed.

Document Review

As mentioned, for the review, the periodic reports on monitoring and inspections have been consulted. The ROD, the remedial investigation report, the feasibility study report, the previous five-year review report, and some of the other past documents have also been consulted.

Data Review

The specific objective of the groundwater monitoring at the site was to determine that groundwater contamination was not increasing significantly due to the placement of the road across the site. This was accomplished by monitoring the concentrations of some target metals, total organic carbon (TOC), and total petroleum hydrocarbons (TPH). Groundwater samples were collected from thirteen monitoring wells and analyzed for TOC, TPH and four target metals. A review of the analytical data through April 2003 indicated that TOC and TPH and target metal concentrations in the individual monitoring wells were generally below historic or background values over the last five years. However, there were exceedences of secondary maximum contaminant levels (SMCLs) for manganese and iron in some wells. SMCLs are not enforceable. The concentrations observed for manganese and iron do not pose any risk to human health.

Table 1 presents the results for the analyses of the groundwater samples for the last nine monitoring events. Table 2 shows the level of contamination in the monitoring wells at the high end during the first couple of years of monitoring following the selection of the remedy. These are the concentrations that were not to be significantly exceeded.

Site Inspection

A five-year review site inspection was conducted by the IDEM project manager on October 10, 2003. All existing monitoring wells and the fence appeared to be in good condition. A visual inspection of the landfill area indicated no significant impact on the physical condition of the landfill due to the road and bridge construction. The landfill cap is intact with thick vegetation on the top.

Another site inspection was conducted by the USEPA and IDEM project managers and a representative of the PRP Group on August 31, 2005. Again the site appeared to be in satisfactory condition. The site has a considerable amount of vegetation on the cover, including trees. The surface appears to be in satisfactory condition, with a small amount of wastes having been left on the surface.

The county offices were also visited during the 2005 trip. It was not possible to verify that deed restrictions had been placed on all of the property making up the landfill area.

Response to Comments

The comment letter received by IDEM listed five main concerns: 1) maintaining awareness of the ongoing legacy of the hazardous materials at the site; 2) monitoring and maintaining the stability of the riverbank at the site, especially with a deteriorating dam nearby; 3) whether the fence and warning signs are in satisfactory condition to protect the public from inadvertently entering the site; 4) whether the monitoring wells are there to check on natural bioremediation or to determine if contaminated plumes are present; and 5) if the liability of Arvin Industries at the site will carry over to Arvin-Meritor following its merger with Meritor. IDEM's response was: 1) awareness is addressed through keeping the repository updated, maintaining the site, deed restrictions, and five-year reviews; 2) the site is monitored for integrity and IDEM, as a regulatory agency, will oversee conditions that could adversely impact the site, but IDEM is not aware of any dam renovation plans; 3) the inspections and the five-year reviews will ensure the maintenance of the fence; 4) bioremediation has not been identified as an acceptable remedy at the site; 5) there are provisions in Superfund to deal with any changes in the status of a legally responsible party.

No comments were received as a result of the advertisement placed in 2005 announcing the five-year review.

VII. Technical Assessment

Question A. Is the remedy functioning as intended by the decision documents?

Review of the available information indicates that the remedy is functioning as was intended. The contaminant levels in the groundwater have not increased. Vehicular traffic over the approach road and the bridge at the OCL site does not show any adverse impact either on the landfill or on the quality of groundwater.

Question B. Are the exposure assumptions, toxicity data, clean-up levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no major changes in the physical conditions of the site or in the quality of the groundwater that would affect the protectiveness of the remedy. No new exposure assumptions are needed at this time.

The primary applicable or relevant and appropriate requirements (ARARs) that the site has to meet fall into two categories of regulations: landfill and groundwater. All the federal and state regulatory requirements are being met and no new ARARs need to be considered at this time.

There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment. The remedy is progressing as expected and it is anticipated that all the required groundwater standards will be maintained.

Question C. Has any other information come to light that could call into question the protectiveness of the remedy?

There has been no new information that would suggest that the selected remedy is not protective, except that it has been determined that institutional controls do not presently cover the entire landfill site.

Technical Assessment Summary

Based on the review of analytical data and the site inspection reports over the last five years and discussions with the technical staff from IDEM and the PRPs involved at this site, it is concluded that the remedy is functioning as intended by the ROD except that institutional controls are not in place for the entire site.

VIII. Issues

The main issue that has been identified for the site is the fact that not all of the deed restrictions have been implemented. The remedy included restrictions on land and water use on the landfill.

IX. Recommendations and Follow-Up Actions

The restrictive covenants for the remaining areas of the site must be recorded. The PRP Group has been requested, in a letter dated September 9, 2005, to evaluate the implementation of the institutional controls at the site. Once the evaluation has been performed, a plan for any necessary work needed to complete the implementation of the institutional controls can be developed. In the letter, USEPA requested a copy of any local ordinance that has been enacted to restrict use of land and groundwater at the site. If no such ordinance exists, U.S. EPA might request that such an ordinance be enacted to provide an additional layer of protection against exposure to site contaminants. It should be possible to complete this within about six months.

Additional follow-up actions to be implemented at the site include remedial action completion by the responsible parties and certification by IDEM staff. Maintenance and monitoring of the site will continue, as needed, and will consist of activities to be determined. Five-year reviews will need to be continued.

X. Protectiveness Statement

The remedy is protective of human health and the environment in the short-term. The remedy is not protective of human health and the environment in the long term since some of the institutional controls that are needed to prevent future exposure to, or ingestion of, contaminated groundwater and exposure to the contents of the waste disposal area have not been implemented. Long-term protectiveness will be achieved once the required ICs have been implemented. Threats at the site are being addressed through groundwater monitoring, implementation of the required ICs, and continued maintenance of the site.

XI. Next Review

The next five-year review for the OCL site is required in September 2010, five years from the date of this review.

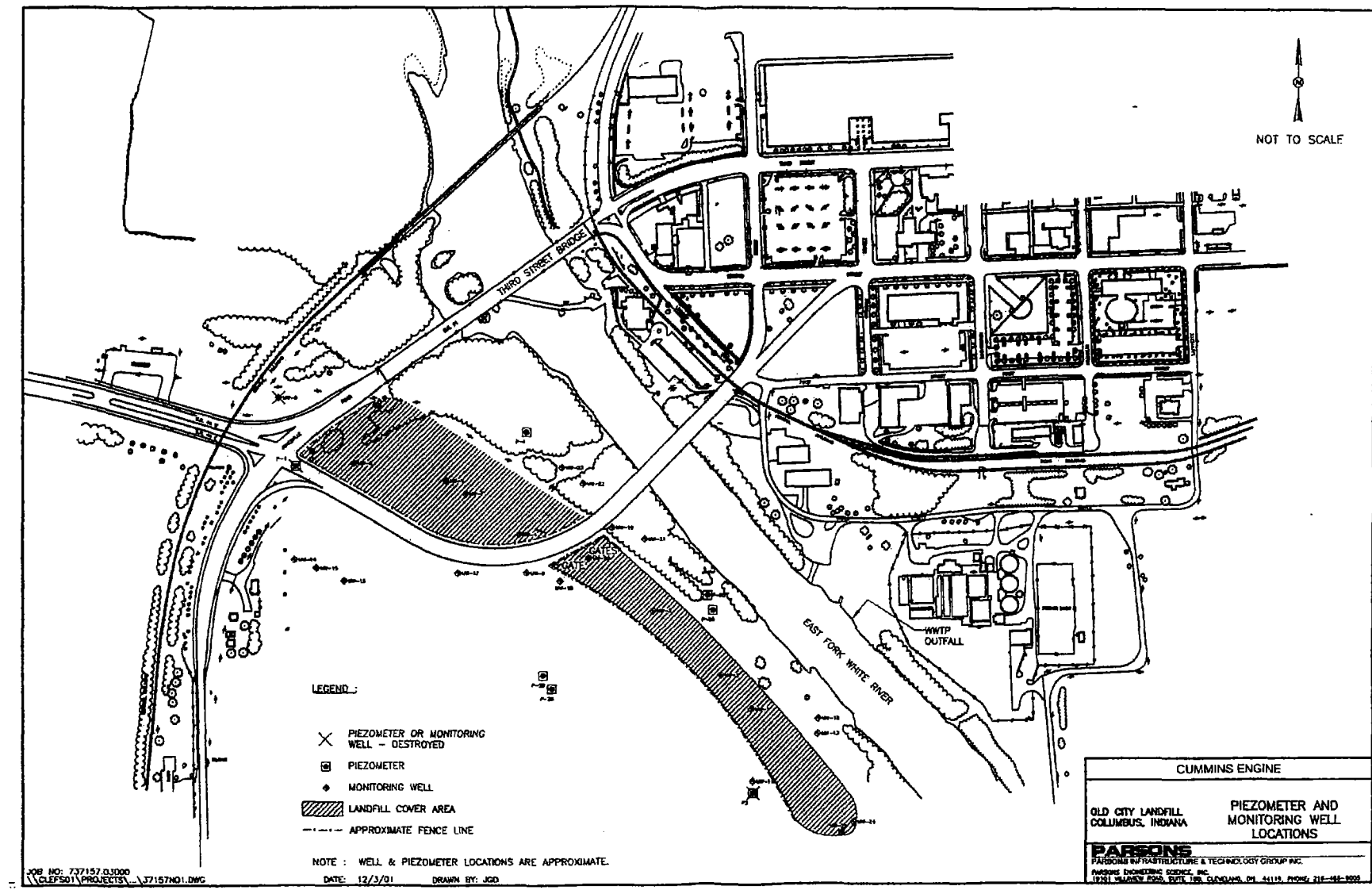


Figure 1. OCL Site

Table 1. Some Recent Results for Monitored Parameters
Concentrations in µg/l for metals, mg/l for TOC and TPH
Columbus Old Municipal Landfill #1, Columbus, IN

Parameter & Date		Well MW09	Well MW11	Well MW12	Well MW13	Well MW14	Well MW16	Well MW17	Well MW19	Well MW20	Well MW21	Well MW23	Well MW24	Well MW25
A r s e n i c	4/99	<4	<4	<4	<4	<4	<4	<4	<4	4	<4	<4	<4	5
	6/99	<4	<4	<4	<4	<4	<4	<4	<4	5	<4	<4	<4	8
	8/99	--	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	8
	10/99	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<10
	4/00	<4	<4	<4	<4	<4	<4	<4	<4	6	<4	<4	<4	<4
	10/00	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	4/01	<5	<5	<5	5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	9/01	<5	<5	15	<5	5	<5	<5	<5	6	5	6	<5	<5
	4/02	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<5
I r o n	4/99	<12	<12	20	<12	13	<12	<12	<12	1830	42	<12	1029	2770
	6/99	<10	<10	17	194	48	<10	<10	34	928	90	<10	533	2470
	8/99	--	<12	2567	404	<12	<12	<12	<12	288	50	<12	1616	3440
	10/99	<12	<12	732	1197	<12	<12	<12	505	455	26	<12	88	12,600
	4/00	<12	<12	<12	<12	<12	<12	<12	<12	6300	<12	<12	237	2300
	10/00	<10	<10	<10	40	<10	<10	20	<10	706	23	<10	969	1450
	4/01	<10	<10	43	<10	<10	<10	<10	1920	4790	11	<10	967	4130
	9/01	<10	<10	566	253	<10	<10	<10	61	27	20	<10	354	7160
	4/02	<10	<10	<10	<10	<10	<10	<10	<10	1160	<10	<10	<10	1730
M a n g a n e s e	4/99	<9	<9	378	286	<9	<9	45	419	405	102	<9	104	336
	6/99	<9	290	592	453	<9	12	75	509	397	352	<9	97	434
	8/99	--	20	1167	322	389	25	92	369	397	434	<9	89	259
	10/99	<9	<9	686	308	17	<9	53	351	392	322	<9	60	248
	4/00	<9	<9	<9	<9	<9	<9	58	52	422	<9	<9	307	307
	10/00	<5	<5	<5	271	79	<5	75	251	468	9	<4	102	239
	4/01	<5	<5	528	291	<5	<5	66	379	398	219	8	103	534
	9/01	<5	<5	644	255	33	7	39	122	365	390	21	91	385
	4/02	<5	<5	73	6	<5	<5	21	544	387	36	6	6	366

Table 1(con't). Some Recent Results for Monitored Parameters
Concentrations in µg/l for metals, mg/l for TOC and TPH

Parameter & Date		Well MW09	Well MW11	Well MW12	Well MW13	Well MW14	Well MW16	Well MW17	Well MW19	Well MW20	Well MW21	Well MW23	Well MW24	Well MW25
L e a d	4/99	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	6/99	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	8/99	--	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	10/99	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	4/00	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
	10/00	<4	9	<4	<4	<4	6	8	4	5	<4	8	<4	14
	4/01	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	9/01	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
	4/02	<4	<4	<4	<4	<4	<4	<4	5	<4	<4	<4	<4	5
T O C	4/99	<10	<10	<10	<10	<10	<10	<10	<10	11	<10	<10	<10	<10
	6/99	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	8/99	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	16
	10/99	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	4/00	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	10/00	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	4/01	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	9/01	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	4/02	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
T P H	4/99	<1.0	<1.0	1.9	1.6	<1.0	<1.0	<1.0	<1.0	4.7	<1.0	<1.0	1.6	<1.0
	6/99	<1.0	<1.0	<1.0	2.2	<1.0	<1.0	<1.0	<1.0	0.9	<1.0	<1.0	1.8	<1.0
	8/99	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	1.4	<1.0
	10/99	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/00	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0
	10/00	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	2.5	<1.0	<1.0	12.5	1.3
	4/01	4.1	5.0	6.7	2.3	7.4	4.4	12.3	2.8	4.1	2.1	3.6	6.9	4.2
	9/01	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/02	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

TOC is total organic carbon. TPH is total petroleum hydrocarbons. Comparison concentrations: maximum contaminate level (MCL) for arsenic has been 50 µg/l, changes to 10 µg/l on January 23, 2006; for lead, action level is 15 µg/l, treatment technique (primary standard); secondary maximum contaminate level is 300 µg/l for iron and 50 µg/l for manganese.

Table 2. Maximum Concentrations between December 1993 and December 1995
 Also Second Highest Concentrations In Some Cases
 Concentrations in µg/l for metals, mg/l for TOC and TPH
 Columbus Old Municipal Landfill #1, Columbus, IN

Well	Arsenic		Iron		Manganese		Lead		TOC		TPH	
MW09	0.8		281	203	22	16	34*	<1	5.88	4	1.7	
MW11	0.2		2240	333	30	18	38*	4	7.70	6.20	2.1	
MW12	0.6	0.2	390	156	536	518	51*	2	10.6	7.0	1.6	1.5
MW13	2.7	0.2	1190	786	315	296	43*	2	10.0	9.31	7.2	4.0
MW14	0.8		360	233	1270	980	35*	7	11.7	11.0	1.7	1.3
MW16	10.0	0.04	686	278	37	20	38*	9	8	4.49	3.4	1.3
MW17	0.02		138	100	62	56	36*	13	3.6	2.24	2.5	<1.0
MW19	0.8		1480	587	1220	469	20*	2	3.68	3.07	<1.0	
MW20	22	12	12,300	6170	503	480	33	29*	22.9	21.3	6.2	3.5
MW21	0.10		5550	710	949	896	40*	2	7	5	2.0	1.7
MW22	0.2		497	255	1360	1140	30*	1	6.89	5.31	7.1	
MW23	first sample 6/95											
MW24	0.80	0.2	7860	7660	881	630	54*	10	12.3	11	5.8	2.0
MW25	27	19	12,200	10,400	771	608	29*	2	6.80	5.93	1.3	1.0

TOC is total organic carbon. TPH is total petroleum hydrocarbons. *These values for lead were obtained in the first reported sampling event in November/December 1993; they are generally significantly higher than the next highest.